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Giant Teratoma in a Bovine

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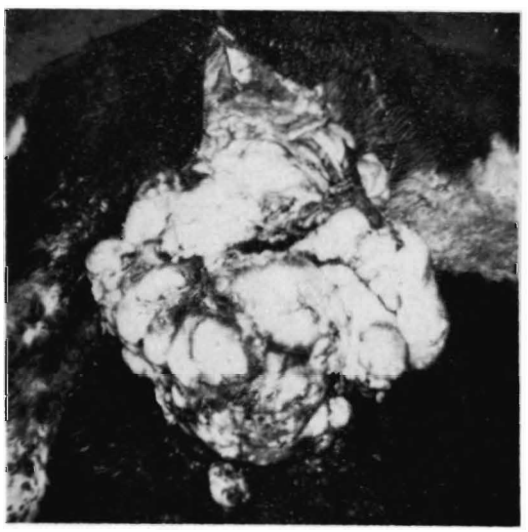
THE TERATOMA, a specialized neoplasm, is not commonly found in the bovine and it does not appear to be of any economic importance. However, the one described below is curious because of its large size and the diagnostic and clinical problem that it afforded.

A brief definition and explanation of what constitutes a teratoma may be indicated at this point. A teratoma is a tumor like mass of tissues derived from more than one of the three primary germ layers: ectoderm, mesoderm or endoderm. The great majority of them occur either in the ovary or testicle but may also be found retroperitoneally. They usually exist since fetal life and are seen more often in young animals. Growth usually occurs slowly over a long period of time before any symptoms are discovered.

The different tissues which a teratoma contains are usually in a confusing mass and may be many in number. They usually contain connective tissue, cartilage and bone, epithelial structures of ectodermal and endodermal origin such as skin, hair and neuroglia. A more common type called



A view of the teratoma protruding from the paraumbar incision showing relative size of the teratoma.

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a dermoid cyst is a cavity lined with skin from which hair grows and may fill the cavity.

A true teratoma must undergo active growth, although it is usually benign in nature. During growth the histological components usually do not vary greatly in proportion. In exceptional cases a particular tissue may grow rapidly and assume malignant qualities such as would a carcinoma or sarcoma.

The teratomas reported so far are usually in the canine or equine species according to Smith and Jones although one instance of an ovarian teratoma was reported by Dr. Smith in a heifer.

CASE REPORT

On June 28, 1960, Dr. L. Cavanaugh of Anthon, Iowa, was called to examine a feedlot heifer at the I. V. Kuhn farm. The heifer, a grade Hereford, weighed approximately 500 lbs. At the time of examination, the owner estimated that she had lost approximately 100 lbs. over the past 2 weeks. According to the owner, the heifer had never gained properly. She had always remained at least 250 lbs. lighter than the rest of the heifers in the group.

On examination the animal exhibited respiratory dyspnea and a distended abdomen which was extremely hard and firm on palpation. The temperature was normal and the bowel movements were regular and normal in consistency and color. The heifer maintained an apparently normal appetite. A tentative diagnosis of a tumorous mass was made and surgery was recommended.

An exploratory laparatomy was made in the right paralumbar region. Upon incision a large tumorous mass presented itself. The mass was surrounded by adhesions which were broken down manually until the main blood supply presented itself. This vessel, apparently from the region of the terminal aorta, was ligated and severed. As could best be determined the tumor like mass was in the region of the immature ovary and uterus. During the suturing of the incision the animal died due to the shock of removal of such a large mass.

The tumorous mass was rather lobulated but round in general outline. The mass weighed 128 lbs. and was approximately 35 inches in diameter, 22 inches across and 14 inches deep. Upon incision the mass proved to be solid throughout, though internally lobulated.

Parts of the tumor were submitted to the Iowa Veterinary Diagnostic Laboratory where histopathological examination revealed cartilage, squamous epithelium, epithelial gland, nerve, muscle and connective tissues.

CONCLUSIONS AND SUMMARY

There have been a number of theories presented as to the cause of teratomas. Because teratomas are usually discovered at a relatively young age in the life of the animal it has been concluded that they are initiated early in fetal or even embryonic life. Their origin is apparently related to abnormal development of the primitive streak because their location is usually in tissues which in embryonic life lie close to the median axis.

Two principal theories have evolved from the above assumptions. One is that abnormal mitosis occurred in an ancestral cell and, like the ovum, was capable of producing any kind of tissue. The product of its growth would constitute essentially a twin, included within the body of the more normal descendent of the ovum. Normal development of the twin would be limited by its environment. A second theory states that certain embryonal cells escape from the primitive streak due to a developmental accident affecting the chemical "organizer" substances of the embryo.

Nevertheless, it seems that if all the tissues of the teratoma are well differentiated into histological types the teratoma remains a slowly enlarging mass with benign effects. If the tissues remain embryonal in nature they can be expected, sooner or later, to be guilty of malignant growth which may be no different than carcinogenic in nature.

REFERENCE

Smith and Jones, Veterinary Pathology, Lea and Febiger, Philadephia, Penn., 1957: Ch. 7.